LA CIENEGA ACEQUIA
286-384 Los Pinos Road
Santa Fe
Santa Fe County
New Mexico

HAER NM-14
NM-14

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

HISTORIC AMERICAN ENGINEERING RECORD

LA CIENEGA ACEQUIA

HAER No. NM-14

LOCATION: 286-384 Los Pinos Road, Santa Fe, Santa Fe County, New Mexico. La Cienega Acequia is located at latitude 35.5746, longitude -106.112. The coordinate represents the approximate location of the Truchas Molino, along La Cienega Acequia on the property of El Rancho de las Golondrinas. This coordinate was obtained on 10 March 2009 by plotting its location on the Turquoise Hill, NM USGS Digital Raster Graphic in ESRI ArcGIS 9.2. The accuracy of the coordinates is +/- 12 meters. The coordinate datum is North American Datum 1927 CONUS.

DATE OF CONSTRUCTION: Ca. 1715, 1896, 1934

PRESENT OWNER: The Community of La Cienega, New Mexico

SIGNIFICANCE: La Cienega Acequia is one of the best preserved acequia systems in New Mexico. An irrigation feature dating to Spanish colonial settlement in the seventeenth century, acequias were constructed to divert water for use in irrigating agricultural fields and pastures. Acequias shaped the surrounding landscape, contributing not only to the physical layout of the villages but to community life and regional identity. La Cienega Acequia remains in operation along relatively unchanged alignments, and contains several traditional water control devices such as dams, checks, and flumes. It remains essential to the local agricultural economy and landscape.

HISTORIANS: J. Robert Estes, Jeff Fredine, Lisa Gavioli, and Tita Berger, 2007

PROJECT INFORMATION: Documentation of La Cienega Acequia was undertaken for the Historic American Engineering Record (HAER), part of Heritage Documentation Programs, National Park Service, Richard O'Connor, Chief. The project was conducted in conjunction with the Santa Fe County Department of Planning, Jack Kolkmeyer, Land Use Adminstrator; El Rancho de las Golondrinas (George Paloheimo, Executive Director); and the 2007 Southwest Summer Institute for Preservation and Regionalism, Chris Wilson, Director, at the University of New Mexico School of Architecture and Planning, Roger Schluntz, Dean. Field work, measured drawings and reports were produced under the direction of Arnold Valdez, UNM Adjunct Associate Professor, and Eric DeLony, Chief of HAER, retired, and completed for transmittal by Christopher H. Marston, HAER

Architect. The documentation was produced for the course, "Acequias: Their Culture and Future," led by Arnold Valdez. The team included UNM students Tita Berger, Ketan Bharatiya, Daniel Barboa, Miles Cook, Donatella Davanzo, Bob Estes, Jaime Estrada, Jeff Fredine, Lisa Gavioli, Eric Haskins, Steve Kramer, Ken Marold, Maria Morrissey, Holly Strachan, Peter Theroux, Gary Vincent, and Rowe Zwahlen. Large format photography was produced by Martin Stupich.

DESCRIPTION

Survey Methods

The survey of La Cienega Acequia was conducted on June 21-22, 2007 by a team of four students, J. Robert Estes, Jeff Fredine, Lisa Gavioli, and Tita Berger, from the University of New Mexico as part of a studio class for the Southwest Summer Institute for Preservation and Regionalism. The team's assignment was to record the natural and cultural landscape of the acequia and El Rancho de las Golondrinas. The survey consisted of a reconnaissance of the acequia easement and an inventory of the features observed along the acequia. The team noted the current condition of the acequia, modifications to its alignment, erosion prevention efforts, renovations, and the technology used to transfer water from the acequia to adjacent fields. Features included *compuertas* (combination checks and tapboxes), retaining walls, *canoas* (pipe flumes), *puertas* (tapboxes), and *desagues* (drains). The reconnaissance survey revealed four abandoned ditch alignments and that run parallel to the active acequia easement (see Figure 1). In addition, the survey identified and recorded forty-one features along the active acequia (see Figure 2 and Table 1). While most of these are recent additions to the acequia, several represent examples of older irrigation technology.

Project Boundary

The project area is located in the community of La Cienega, in the western part Santa Fe County, New Mexico, and is entirely on private property. The heading for La Cienega Acequia is on Arroyo de los Tanques, a tributary stream of Arroyo Hondo. The acequia follows this arroyo to the southwest, then turns north, and crosses Arroyo Hondo. The acequia continues along the west side of Arroyo Hondo for several miles. The survey, however, terminated at the west end of El Rancho de las Golondrinas property.

La Cienega Acequia diverts from La Cienega Creek, which originates from natural springs and seeps. The diversion of the acequia begins at the Simon property, traverses through this property and other private lands where it enters El Rancho de las Golondrinas, flows the length of this property, and then continues through several other community properties. The class documented was approximately two miles of the acequia. Boundaries for the acequia landscape are defined by modifications undertaken primarily for agriculture. These agricultural modifications are bound by valley walls that run northeast/ southwest with La Cienega Creek with the acequia running through the middle. La Cienega Creek is intersected by Arroyo de los Tanques and Arroyo Hondo on the east and by the Santa Fe River on the west.

Abandoned Acequias

The survey identified segments of four abandoned ditches (A1–A4). Three of these (A1, A2, and A3) run parallel to the current alignment. The fourth abandoned ditch extends north from the current alignment towards the west bank of Arroyo Hondo. Abandoned Acequias A1–A3 are ephemeral, filled with sediment, and/or overgrown. Some portions of these ditches have also eroded away completely, but could be identified by shallow swales on narrow terraces that followed contours of hill slopes. Following these swales eventually led to short segments of open ditch with intact ditch banks and abandoned water control features, usually protected from erosion by large trees. In contrast, A4 is completely covered by dense shrubby vegetation. The ditch bank and channel are intact but invisible beneath the dense overgrowth.

Abandoned Acequia A1 is located above the confluence of Arroyo Hondo and Arroyo de los Tanques (Figure 3). This ditch is about 89 m (291') long and runs at an elevation about 1 m (3.3') lower than the active acequia. It varies in cross section profile from a 1–to–2–m (3.3'–to–6.6') wide terrace, to a ditch 1 meter (3.3') wide and about 20–40–cm (8"–16") deep. The remains of a check (Feature 32) are at the northeast end of the ditch near an active spring (Figure 4). The check is constructed of two 1" angle irons standing on end, about 1' apart. The check was operated by hand, but the remains of the gate are missing. The south end of the ditch is truncated by a bladed road, while the north end is truncated by erosion on the terrace.

Abandoned Acequia A2 runs west in discontiguous segments along the north terrace of the Arroyo de los Tanques. It then turns to the north along the terrace, where it fed an abandoned earth tank. Portions of this ditch have been completely washed out by flooding. The ditch bank is eroded into a low, linear mound or is completely destroyed. Its cross section is a 1–to–2–m (3.3'–to–6.6') wide terrace, to a ditch 1 meter (3.3') wide and about 10–20–cm (4"–8") deep. A bladed road truncates the west end of A2, where it may have been contiguous with the northern extent of A1. The active acequia, 1–to–2–m (3.3'–to–6.6') above this ditch, is now lined with a narrow concrete channel and is shored by basalt boulders in some places (Figures 5 and 6). The east end of A2 is either truncated by recently terraced fields, or merges with the active acequia. The dam for this ditch may have been located at or near an alignment of basalt boulders and an erosion control feature now designated Features 38 and 39 (Figures 5 and 6).

Abandoned Acequia A3 is parallel to the active acequia on the El Rancho de las Golondrinas property (Figure 7). This ditch is a shallow discontiguous swale about 1–to–2–m (3.3'–to–6.6') wide and about 126 m (413') long. It originates at the east end of the Los Golondrinas property and terminates near the small grist mill. The ditch bank for A3 forms the north bank of the active acequia. Grasses, weeds, and trees obscure the details of A3, but the alignment is easily passable on foot. The east end of A3 ends at the north end of the Las Golondrinas property, where Arroyo Hondo bends to the north thereby creating only a narrow band of irrigable land. The west end is truncated by a bladed road on Las Golondrinas property. Runoff from higher ground has filled in or washed-out short portions of A3.

Abandoned Acequia A4 is at the northern most extent of the active acequia, and west of the flume that crosses Arroyo Hondo. Overgrown by Russian olive, wild roses and sage, it is about 30 m (100') long and 5 m (16.5') wide. The ditch banks are apparently intact beneath the dense

overgrowth. Acequia A4 was probably abandoned when the flume was constructed. It is aligned with the active ditch, northeast of the flume outlet. The abandoned ditch is truncated by a plowed field on the north and by the buried pipeline and bladed road on the south.

The presence of abandoned ditches indicates that La Cienega Acequia or Las Golondrinas has been engineered or reconstructed at least one time. Because destructive erosion was a problem along some segments (A 2 and A 3) of the acequia, it was probably necessary to reengineer the entire acequia—including unaffected segments—in order to ameliorate the problem. However, the location of A4 north of the current alignment suggests that the acequia once crossed Arroyo Hondo above the current flume. A survey of the both sides of the arroyo provided no evidence of an earlier ditch or flume.

Water Control Features

The inventory began at the south end of the acequia on Las Golondrinas property and continued about 3.2 km (2 miles) northeast to the *cabecera*, the headgate for the acequia. The survey identified forty-one features along the acequia (Figure 2; Table 1). The features include pipes, flumes, *canoas*, checks, *compuertas*, and *puertas*. Two abandoned *estanques* (impoundments) were also identified along the acequia. Only one *estanque* (Feature 34) is reported here. The other is a more recent construction and— although abandoned— contains state of the art water delivery technology to irrigate cultivated fields.

Of the features observed on La Cienega Acequia only a few represent materials, workmanship, and technology beginning with the Spanish Colonial period (AD 1692–1820) and ending with the Territorial Period (AD 1848–1912). These are the ditches (A1, A2, A3, A4, and most of the current acequia alignment), *canoas* (Features 6 and 13; Figure 8), unknown erosion control structures—possibly elements of *compuertas* (Features 15 and 39; Figures 9), and the remains of a *presa* (Feature 38; Figure 10). Of these, the *canoas* are recently built replicas which demonstrate traditional technology while supplying water to vintage *molinos* (grist mills) at El Rancho de las Golondrinas.

All the functioning *compuertas* are of twentieth century materials—concrete, cast iron, lywood, and sheet metal —while retaining the traditional design using a complementary check and a tapbox. Pipe flumes with concrete intakes and *desagues* (Features 1 and 30) are also twentieth century technology. Feature 1 probably replaced a wooden *canoa*, whereas Feature 30, a pipe flume, was constructed between 1896 and 1934. Single gate *puertas* are all of twentieth century design and materials, such as pipes made of concrete, terracotta, galvanized metal, or PVC. *Compuertas* have also been replaced with siphons and hoses, which supply water-reducing drip systems. Wooden framed *puertas* were rarely encountered, and all were decommissioned. Typically these *puertas* are a rectangular wooden frame, which support tracks for a simple lift gate (Figure 11). The tracks and fragments of milled lumber indicate that gates were often made from 2" milled lumber. Later, these were replaced by concrete structures that supported gates of milled lumber, plywood, and galvanized sheet metal. One culvert (Feature 22) serves to protect the acequia from erosional damage, and at the same time conducts runoff into fields for irrigation. Fields fed by rainfall are called *temporales* and are usually reserved for drought

tolerant crops. Finally, the abandoned dam at the head of La Cienega Acequia and de los Tanques Acequia has been replaced by a *compuerta* (Figure 12).

The water delivery technology on the La Cienega Acequia does not represent traditional materials and workmanship. However, most of the abandoned and recently constructed *compuertas* and *puertas* are located at boundaries between properties, terraced fields and/or soil types. The close proximity of water control features and physical boundaries indicates social and economic boundaries that have probably existed for long periods of time. In addition, recent studies of acequias provide the information to understand broader patterns of settlement, subsistence, economic, and social interaction from the period of Spanish colonization to the current condition of Santa Fe's expansion into surrounding communities.

HISTORY

Irrigation works, in the form of acequias, were among the first features constructed when Spanish *colonos* (settlers) established settlements in the seventeenth century in this northernmost region of Nueva Espaňa, La Provincia de San Felipe del Nuevo Mexico. A *presa* (dam) would be constructed along a stream or river, raising the water level enough to divert it into the *acequia madre* (mother ditch) from which water could then be diverted into *sangrias* (lateral ditches) through *compuertas* (headgates) for use in irrigating agricultural fields or grazing pastures, eventually draining back into the stream at the *desague* (outlet). These features shaped the landscape, extending the riparian zone out into the valley, forming the spatial boundaries of each settlement, and contributing not only to the physical layout of the villages but to community life and regional identity. [1]

Although acequias were present in the region prior to Spanish contact and up to the Pueblo Revolt of 1680, development intensified after the Spanish reconquest. This development was usually part of an official land grant by the Spanish Government to an individual or group. These land grants generally included irrigable bottom-land called the "*joya*," non-irrigable meadows called "*vegas*," and uplands called "*dehesas*." The *joya* was used for farming while the *vegas* and *dehesas* were used for grazing. As one of the first acts in establishing a land grant, an acequia would be constructed and adjacent land would be equally partitioned into long-lot fields perpendicular to the acequia. When the flood plain was too narrow, additional *varas*—a Spanish measurement used to gage the width of fields—of land were given to farmers in order to ensure equal access to the acequia.[2]

Although different from an official land grant, Miguel de la Vega y Coca obtained a "Royal Purchase" for the area around La Cienega in the early 1700s. Archaeological evidence also indicates an even earlier, pre-Pueblo Revolt occupation of the area dating between 1620-1680. The founding date confusion for La Cienega may be because the area was made up of several ranches founded at different times and because the community had an *arriba* (upper) area known

[1] Jose A. Rivera, *Acequia Culture: Water, Land, and Community in the Southwest* (Albuquerque: University of New Mexico Press, 1998), 1-12.
[2] Alvar Carlson, "Long-Lots in the Rio Arriba, " *Annals of the Association of American Geographers* 65, no. 1 (1975): 50.

as El Alamo and an *abajo* (lower) area known as Las Golondrinas.[3]

Las Golondrinas was one of the first ranches established in the area and became the first stop south of Santa Fe along El Camino Real de Tierra Adentro. The *sala* was the earliest component of the ranch to be built with additional rooms, a *torreon*, and a *zaguan* entrance completing the enclosed *hacienda*. The presence of the *torreon* and the enclosed *hacienda* indicate that the community continued to have problems with Native Americans well beyond the 1692 reestablishment of Spanish control over the area after the Pueblo Revolt. In fact, the name Las Golondrinas (the swallows) first appears in the 1780 journal of Juan de Anaza, a future Governor of New Mexico who came to prominence fighting Native Americans throughout the West. The property eventually became a living history museum and the hacienda was restored and portions of it were reconstructed along with the addition of other buildings and features pertinent to life in the seventeenth and eighteenth centuries.[4]

Consistent with the trend of post-reconquest acequia development, La Cienega Acequia was constructed some time prior to 1739. Along with the acequia, the traditions associated with irrigation farming were also developed. These traditions included an acequia association composed of *parciantes*, or acequia members, who elect a *mayordomo* to manage the acequia. The *mayordomo* and *parciantes* also participate in the annual *limpa*, or spring cleaning of the ditch. Crops associated with these farming practices often included corn, beans, squash, chile, melons, tomatoes, garlic, onions, and tobacco, as well as vineyards, apples, apricots, quince, peaches, cherries, pears, and plums.[5]

The acequia was also essential for other activities such as powering a grist mill. Milling grain was an essential part of life and was accomplished in the *molino*, which had a grinding wheel powered by water from the acequia. A *molino* in La Cienega was noted in the 1815 will of Manuel Delgado, who married into the Vega y Coca family. Since the property became a museum, two additional *molinos*, one still operational, have been added to El Rancho de las Golondrinas. The operational *molino* has been relocated from the Village of Truchas and is powered by acequia water delivered through a hand-carved *canoa*. This is possibly the last operational acequia-powered *molino* in New Mexico.[6]

The twentieth century slowly brought modernization to La Cienega, Las Golondrinas, and the acequia. La Cienega saw modernizations such as electricity and automobiles, and Las Golondrinas was purchased from the descendents of the Baca-Delgado-Vega y Coca clan by the Curtin-Paloheimo family and eventually became the living history museum El Rancho de las

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[3] Louann Jordan, "El Rancho de las Golondrinas" [Pamphlet], El Rancho de las Golondrinas, Santa Fe, 2005; George C' De Baca, *The Eden of la Cienega* (Albuquerque: Morris Publishing, 1998), 10-11.

[4] Jordan, "El Rancho de las Golondrinas."

[5] Jordan, "El Rancho de las Golondrinas"; C' De Baca, *The Eden of la Cienega*; Enrique Lamadrid, "Acequias in Practice and Spirit: A Sustainable Eco-Cultural Legacy" (Exhibit guide, Acequias of New Mexico Exhibit, El Rancho de las Golondrinas, 2006-2008).

[6] Charles F. Gritzner, "Hispano Gristmills in New Mexico," *Annals of the Association of American Geographers* 64, no. 4 (December 1974): 514-524; John O. Baxter, *Acequia System of El Rancho de las Golondrinas,* National Register Nomination, 1979; See also Truchas Molino, HAER No. NM-14-A.

Golondrinas in 1972. All the while, through the World War I and the Depression, La Cienega Acequia continued to provide water for farming, although newer crops such as asparagus, rhubarb, and potatoes began to be cultivated. Eventually, World War II and then general prosperity began to cause a slow but dramatic decrease in the number of farmers as people moved away for high-paying jobs in larger cities. As this trend developed in La Cienega and throughout New Mexico, people became part-time farmers, subdividing lots and reducing the size of fields.[7] Nonetheless, La Cienega Acequia continues to operate as a vital means of irrigation for the remaining agricultural community, preserving the tradition of a 300 year old cultural landscape.

[7] Neal W. Ackerly, *A Review of the Historic Significance of and Management Recommendations for Preserving New Mexico's Acequia System,* Dos Rios Consultants, Silver City, New Mexico, 1996; C' De Baca, *The Eden of la Cienega;* Jordan, "El Rancho de las Golondrinas."

APPENDIX A: Maps and field photos

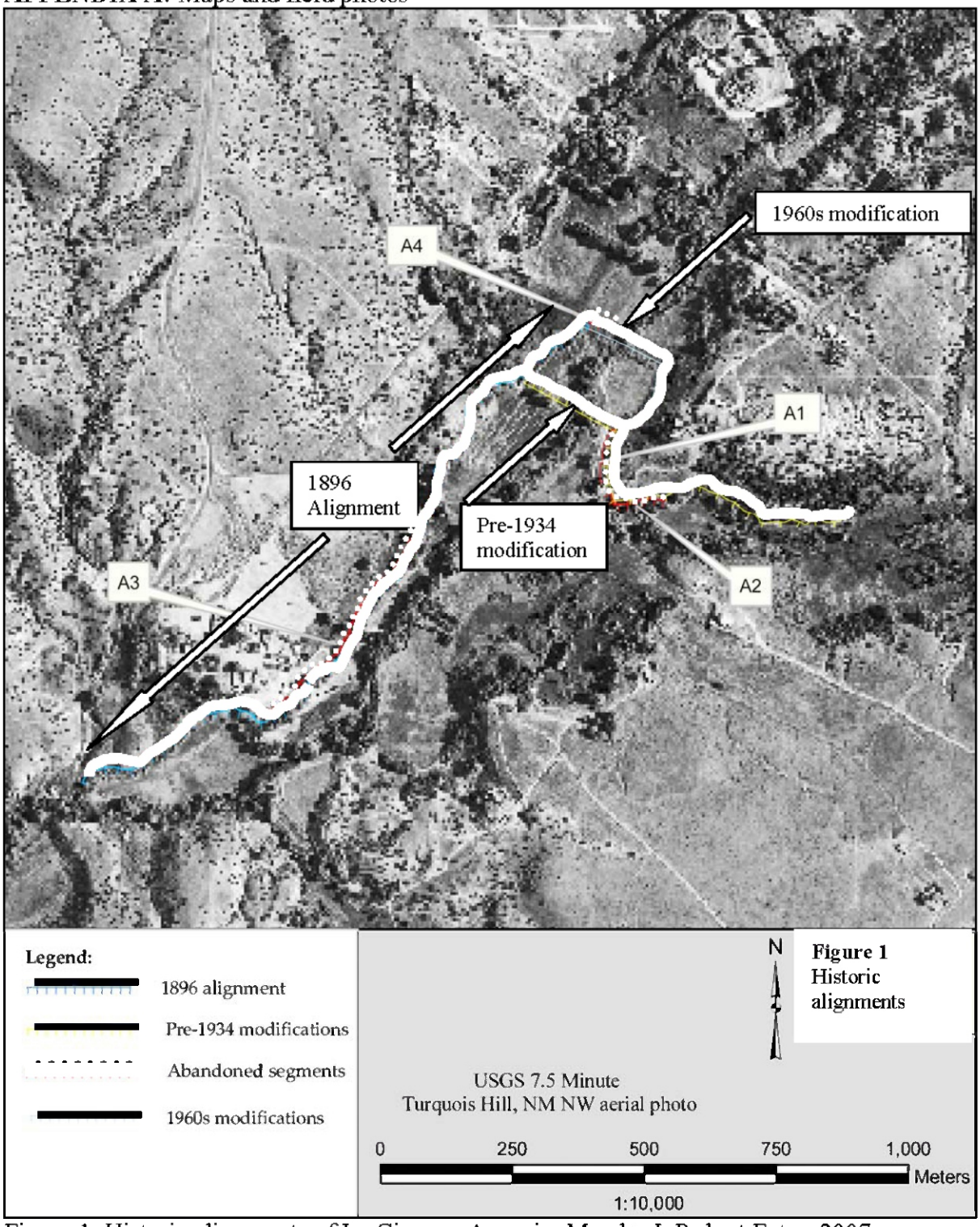

Figure 1. Historic alignments of La Cienega Acequia. Map by J. Robert Estes, 2007.

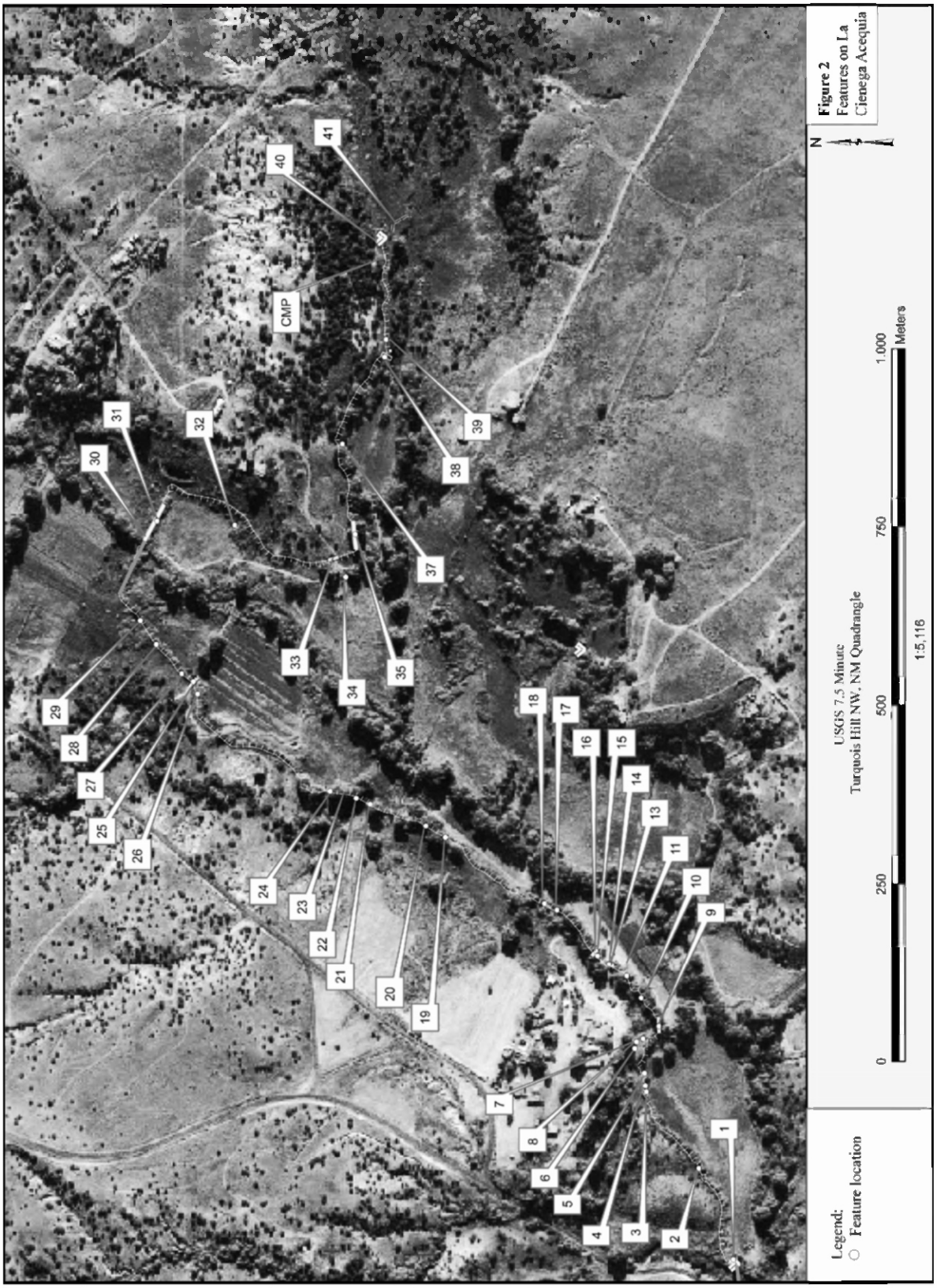

Figure 2. Features on La Cienega Acequia. Map by J. Robert Estes, 2007.

Figure 3. Abandoned acequia alignment (A1). Photo by J. Robert Estes, 2007.

Figure 4. Feature 32, frame for abandoned check/*compuerta*. Photo by J. Robert Estes, 2007.

Figure 5 . Concrete lined acequia above abandoned ditch A2. Photo by J. Robert Estes, 2007.

Figure 6. Basalt rock shoring on ditch bank above abandoned acequia A2. Photo by J. Robert Estes, 2007.

Figure 7. Abandoned ditch segment A3. Photo by J. Robert Estes, 2007.

Figure 8. Feature 13, *canoa* to Talpa Molino. Photo by J. Robert Estes, 2007.

Figure 9. Feature 15 erosion control feature on ditch bank. Photo by J. Robert Estes, 2007.

Figure 10. Feature 38, boulder alignment, possible remains of dam on A2. Photo by J. Robert Estes, 2007.

Figure 11. Wood frame tapbox, abandoned. Photo by J. Robert Estes, 2007.

Figure 12. Abandoned *presa* on Arroyo de Los Tanques Feature 41. Photo by J. Robert Estes, 2007.

TABLE 1: Inventory of features on La Cienega Acequia. Compiled by J. Robert Estes, 2007

ID	Description	Setting
1	Flume and *desague*, concrete structure, with steel pipe flume and corrugated, galvanized *desague*.	South end of plowed fields, crossing over an unnamed arroyo.
2	*Compuerta*, concrete check with siphons, hose and balls valves	Located between upper an lower portions of the south field on Ancho clay loam soils (An).
3	*Puerta*, remains of wooden tapbox 1" cross section, embedded in acequia bank.	Located at northern most edge of south field (An). About 25 m (82 ft) west of Truchas Molina.
4	*Puerta* (tapbox) PVC pipe embedded in acequia bank, with cap.	Replaces wooden tapbox.
5	Iron strap in acequia bank, probable remains of *puerta*	North edge of south field about 20 m (66 ft) west of Truchas Molino.
6	*Canoa* to Truchas Molina, at El Rancho de Las Golondrinas	Above active ditch
7	Retaining wall, basalt boulder southeast of Truchas Molina.	Midway on the terrace, at north end of south field at boundary of An and Ed soils. Large cottonwoods grow along ditch.
8	Abandoned ditch, carried water towards Truchas Molino, possible recent addition	Above active ditch
9	Metal culvert and earthen bridge under road	Base of terrace
10	Pipe flume, carries water to *canoas* for Truchas Molino	Built over ditch alignment from a culvert and bridge
11	Bridge with stone abutment, intake for pipe flume, includes screw lift gate	On ditch over cultivated terrace
12	Riprap shoring for ditch bank	Upstream of pipe intake
13	*Canoa*, intake for Talpa Molino	Downslope of acequia bank
14	*Puerta*, decommissioned wooden tapbox, 1" x 6" frame, tracks for 2" thick gate	On ditch bank at Molino intake
15	Erosion control feature, Out take, basalt lined *canale* behind outbuildings, 33" wide x 3.3'long	North end of cultivated fields; corn, beans, squash; Ed soils
16	Wooden foot bridge, with galvanized culvert	On road at boundary between upper and lower fields on Ed soils
17	*Puerta*, sandstone slab and concrete, decommissioned	South east edge of Feature 18; East end of Ed soils
18	*Compuerta*, concrete, with plywood gate, sewer pipe *puerta*, probably replaced Feature 17	
19	Concrete check	Terraced boundary between Ed and FT soils, and fenced property boundary
20	Check, "T" post, and 2" x 12" milled lumber gate	
21	*Compuerta*, 2" x 4" milled lumber check and terra cotta *puerta* tapbox	North end of lavender field and earthen tank.
22	Culvert, under acequia. Protects acequia from erosion flooding and diverts water to field	Bottom of erosion channel; diverts water onto north south end of field.
23	Culvert under road and earthen bridge	South end of field
24	*Puerta*, sheet metal gate with galvanized culvert and broken sewer pipe	South end of field on FT soils
25	Bridge culvert and buried pipe	

TABLE 1 (continued): Inventory of features on La Cienega Acequia.

ID	Description	Setting
26	*Puerta*, cinderblock tapbox, rebuilt from older concrete tapbox	
27	*Compuerta* and intake for bridge, sheet metal with screwlift cast iron gates.	
28	*Puerta*, tapbox with rebar frame and plywood gate.	
29	*Puerta*, tapbox with concrete sidewalls, 2" by 10" milled limber gate	
30	Flume, includes concrete drop and *desague* at intake, screw lift gate.	East side of Arroyo Honda
31	Concrete lined ditch to flume intake	Terrace on east side of Arroyo Hondo
32	Abandoned check on abandoned acequia segment (A2), upright 1" angle irons, 12" apart	Terrace slope, west facing, above confluence of Arroyo Hondo and Arroyo del los Tanques
33	Abandoned tapbox on active acequia, concrete and 2" by 4" lumber, feeds *estanque* (impoundment) through buried galvanized culvert	Terrace slope, west facing, above confluence of Arroyo Hondo and Arroyo del los Tanques
34	*Estanque* (impoundment) earthen tank, cinderblock lined intake channel, cinder block and masonry outlet dam with cast iron screw lift gate.	Terrace slope, west facing, above confluence of Arroyo Hondo and Arroyo del los Tanques
35	Concrete lined ditch, active	Terrace slope, south facing, above Arroyo del los Tanques
36	Retaining wall, boulder shoring for acequia on steep slope	Terrace slope, south facing, above Arroyo del los Tanques
37	*Puerta*, sheet metal tapbox above corral, replaced by galvanized reservoir and siphon, feeds tanks in corral	Terrace slope, south facing, above Arroyo del los Tanques
38	*Presa*, abandoned, alignment of large basalt boulders parallel to and south of canal.	Terrace slope, near Cienega
39	Erosion control feature, basalt boulders small on ditch bank; ca. 5– by– 3– m (16.5–by–10–ft) Possible *cabecera* (header),	East of *presa*
40	*Cabecera/compuerta* , sheet metal with cast iron screw lift gates	Adjacent to abandoned dam
41	Dam, masonry and concrete dam on La Cienega creek.	

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